```
                10        20        30        40        50        60
HUMAN   MGIVEPGCGDMLTGTEPMPGSDEGRAPGADPQHRYFYPEPGAQDADERRGGGSLGSPYPG
        ::::::::::::::::::: :::::.:::: :::.::::::::  .::.:.::::.:: :
MOUSE   MGIVEPGCGDMLTGTEPMP-SDEGRGPGADQQHRFFYPEPGAQDPTDRRAGSSLGTPYSG
                10        20        30        40        50

CONS    MGIVEPGCGDMLTGTEPMP SDEGR PGAD QHR FYPEPGAQD   RR G SLG PY G


                70        80        90       100       110       120
HUMAN   GALVPAPPSRFLGAYAYPPRPQAAGFPGAGESFPPPADAEGYQPGEGYAAPDPRAGLYPG
        ::::::: :.::::::..::::: :..::::: :: :::::: :::: : .:: :::::::::::
MOUSE   GALVPAAPGRFLGSFAYPPRAQVAGFPGPGEFFPPPAGAEGYPPVDGYPAPDPRAGLYPG
            60        70        80        90       100       110

CONS    GALVPA P RFLG  AYPPR Q AGFPG GE FPPPA AEGY P  GY APDPRAGLYPG


               130       140       150       160       170       180
HUMAN   PREDYALPAGLEVSGKLRVALNNHLLWSKFNQHQTEMIITKQGRRMFPFLSFTVAGLEPT
        :::::::::::::::::::::::::.::::::::::::::::::::::::::::::::::::::
MOUSE   PREDYALPAGLEVSGKLRVALSNHLLWSKFNQHQTEMIITKQGRRMFPFLSFTVAGLEPT
           120       130       140       150       160       170

CONS    PREDYALPAGLEVSGKLRVAL NHLLWSKFNQHQTEMIITKQGRRMFPFLSFTVAGLEPT


               190       200       210       220       230       240
HUMAN   SHYRMFVDVVLVDQHHWRYQSGKWVQCGKAEGSMPGNRLYVHPDSPNTGAHWMRQEVSFG
        :::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
MOUSE   SHYRMFVDVVLVDQHHWRYQSGKWVQCGKAEGSMPGNRLYVHPDSPNTGAHWMRQEVSFG
           180       190       200       210       220       230

CONS    SHYRMFVDVVLVDQHHWRYQSGKWVQCGKAEGSMPGNRLYVHPDSPNTGAHWMRQEVSFG


               250       260       270       280       290       300
HUMAN   KLKLTNNKGASNNVTQMIVLQSLHKYQPRLHIVEVNDGEPEAACNASNTHIFTFQETQFI
        ::::::::::::::::::::::::::::::::::::::::::::::::::::.:::::.:::::::::
MOUSE   KLKLTNNKGASNNVTQMIVLQSLHKYQPRLHIVEVNDGEPEAACSASNTHVFTFQETQFI
           240       250       260       270       280       290

CONS    KLKLTNNKGASNNVTQMIVLQSLHKYQPRLHIVEVNDGEPEAAC ASNTH FTFQETQFI
```

Fig. 1A

```
              310       320       330       340       350       360
HUMAN  AVTAYQNAEITQLKIDNNPFAKGFRENFESMYTSVDTSIPSPPGPNCQFLGGDHYSPLLP
       :::::::::::::::::::::::::::::::::::.::::.:::::::::::.:::: .::::
MOUSE  AVTAYQNAEITQLKIDNNPFAKGFRENFESMYASVDTSVPSPPGPNCQLLGGDPFSPLLS
          300       310       320       330       340       350


CONS   AVTAYQNAEITQLKIDNNPFAKGFRENFESMY SVDTS PSPPGPNCQ LGGD FSPLL



              370       380       390       400       410       420
HUMAN  NQYPVPSRFYPDLPGQAKDVVPQAYWLGAPRDHSYEAEFRAVSMKPAFLPSAPGPTMSYY
       :::::::::::::::: ::... : ::::.::.::::::::::::..:::::::. ::
MOUSE  NQYPVPSRFYPDLPGQPKDMISQPYWLGTPREHSYEAEFRAVSMKPTLLPSAPGPTVPYY
          360       370       380       390       400       410


CONS   NQYPVPSRFYPDLPGQ KD   Q YWLG PR HSYEAEFRAVSMKP LPSAPGPT YY



              430       440       450       460       470       480
HUMAN  RGQEVLAPGAGWPVAPQYPPKMGPASWFRPMRTLPMEPGPGGSEGRGPEDQGPPLVWTEI
       ::::.::::::::::::::::::::::::::.::::::::::::.:: :.:: .:   . :  :.
MOUSE  RGQDVLAPGAGWPVAPQYPPKMSPAGWFRPMRTLPMDPGLGSSEEQG----SSPSLWPEV
          420       430       440       450       460       470


CONS   RGQ VLAPGAGWPVAPQYPPKM PA WFRPMRTLPM PG G SE  G        P  W E



              490       500       510       520       530
HUMAN  APIRPESSDSGLGEGDSKRRRVSPYPSSGDSSSPAGAPSPFDKEAEGQFYNTFPN
       .  ..:: ::::::::::.::::.:::::::::::::::::::::::.:::::::::
MOUSE  TSLQPEPSDSGLGEGDTKRRRISPYPSSGDSSSPAGAPSPFDKETEGQFYNYFPN
          480       490    ↑↑↑↑ 500       510       520       530

CONS       PE SDSGLGEGD KRRR SPYPSSGDSSSPAGAPSPFDKE EGQFYNYFPN
```

Fig. 1A (continued)

```
                    10        20        30        40        50        60
HUMAN  ATGGGCATCGTGGAGCCGGGGTTGCGGAGACATGCTGACGGGCACCGAGCCGATGCCGGGGG
       :::::::::::::::::::::: ::::::::::::::::::: ::::::::::::::::::  :
MOUSE  ATGGGCATCGTGGAGCCGGGGCTGCGGAGACATGCTGACCGGCACCGAGCCGATGCC---G
                    10        20        30        40        50


                    70        80        90       100       110       120
HUMAN  AGCGACGAGGGCCGGGCGCCTGGCGCCGACCCGCAGCACCGCTACTTCTACCCGGAGCCG
       ::  :::::::::::::: ::: :: :: :::: ::::: :: : :::::: :: ::::::
MOUSE  AGTGACGAGGGCCGGGGGGCCCGGAGCGGACCAACAGCATCGTTTCTTCTATCCCGAGCCG
            60        70        80        90       100       110


                   130       140       150       160       170       180
HUMAN  GGCGCGCAGGACGCGGACGAGCGTCGCGGGGGCGGCAGCCTGGGGTCTCCCTACCCGGGGG
       ::::: ::::::: :: ::: :: :::: :: ::::::::::: ::::::: : :::
MOUSE  GGCGCACAGGACCCGACCGATCGCCGCGCAGGTAGCAGCCTGGGGACGCCCTACTCTGGG
        120       130       140       150       160       170


                   190       200       210       220       230       240
HUMAN  GGCGCCTTGGTGCCCGCCCCGCCGAGCCGCTTCCTTGGAGCCTACGCCTACCCGCCGCGA
       ::::: ::::::: ::: ::::: : :::::::::::: ::: ::::::::::::: ::
MOUSE  GCGCCCTGGTGCCTGCCGCGCCGGGTCGCTTCCTTGGATCCTTCGCCTACCCGCCCCGG
        180       190       200       210       220       230


                   250       260       270       280       290       300
HUMAN  CCCCAGGCGGCCGGCTTCCCCGGCGCGGGCGAGTCCTTCCCGCCGCCCGCGGACGCCGAG
       : :::: ::: ::::: :::::  : ::::::: ::::::::::::::::  :: :::
MOUSE  GCTCAGGTGGCTGGCTTTCCCGGGCCTGGCGAGTTCTTCCCGCCGCCCGCGGGTGCGGAG
        240       250       260       270       280       290


                   310       320       330       340       350       360
HUMAN  GGCTACCAGCCGGGCGAGGGCTACGCCGCCCCGGACCCGCGCGCCGGGCTCTACCCGGGGG
       :::::: ::: :  :: ::::: ::::::::: :::::::::::::: :::::::::: :::
MOUSE  GGCTACCCGCCCGTGGATGGCTACCCTGCCCCTGACCCGCGCGCGGGGCTCTACCCAGGG
        300       310       320       330       340       350


                   370       380       390       400       410       420
HUMAN  CCGCGTGAGGACTACGCGCTACCCGCGGGACTGGAGGTGTCGGGGAAACTGAGGGTCGCG
       ::::: ::::::::::: : :::::::: :::::::::: ::::: ::::: ::::::
MOUSE  CCGCGCGAGGACTACGCATTGCCCGCGGGGGTTGGAGGTGTCTGGGAAGCTGAGAGTCGCG
        360       370       380       390       400       410
```

Fig. 1B

```
             430       440       450       460       470       480
HUMAN  CTCAACAACCACCTGTTGTGGTCCAAGTTTAATCAGCACCAGACAGAGATGATCATCACC
       :::: ::::::::::::::::::::::::::::  :: :::::::::::::::::::::::
MOUSE  CTCAGCAACCACCTGTTGTGGTCCAAGTTCAACCAGCACCAGACAGAGATGATCATCACT
             420       430       440       450       460       470


             490       500       510       520       530       540
HUMAN  AAGCAGGGACGGCGGATGTTCCCATTCCTGTCATTTACTGTGGCCGGGCTGGAGCCCACC
       ::::: :::::::: ::::::::::::::::::: :: :: :::::::::::::::::::::
MOUSE  AAGCAAGGACGGCGAATGTTCCCATTCCTGTCCTTCACCGTGGCCGGGCTGGAGCCCACA
             480       490       500       510       520       530


             550       560       570       580       590       600
HUMAN  AGCCACTACAGGATGTTTGTGGACGTGGTCTTGGTGGACCAGCACCACTGGCGGTACCAG
       ::::: ::::::::::::::::::: :::::::::::::::::::::::::::::::::::::
MOUSE  AGCCATTACAGGATGTTTGTGGATGTGGTCTTGGTGGACCAGCACCACTGGCGGTACCAG
             540       550       560       570       580       590


             610       620       630       640       650       660
HUMAN  AGCGGCAAGTGGGTGCAGTGTGGAAAGGCCGAGGGCAGCATGCCAGGAAACCGCCTGTAC
       :::::::::::::::::::::::::::::::::::  :: :::::::::::: ::::::  ::
MOUSE  AGCGGCAAGTGGGTGCAGTGTGGAAAGGCAGAAGGCAGCATGCCAGGGAACCGCTTATAT
             600       610       620       630       640       650


             670       680       690       700       710       720
HUMAN  GTCCACCCGGACTCCCCCAACACAGGAGCGCACTGGATGCGCCAGGAAGTTTCATTTGGG
       ::::::: :::::::::::::::: ::::: ::::::::::::::::::::::::::::::::
MOUSE  GTCCACCCAGACTCCCCCAACACCGGAGCCCACTGGATGCGCCAGGAAGTTTCATTTGGG
             660       670       680       690       700       710


             730       740       750       760       770       780
HUMAN  AAACTAAAGCTCACAAACAACAAGGGGGCGTCCAACAATGTGACCCAGATGATTGTGCTC
       ::  :::::::::::: :::::::::::::::  ::::::::::::::::::::::  :: ::
MOUSE  AAGCTAAAGCTCACCAACAACAAGGGGGCTTCCAACAATGTGACCCAGATGATCGTCCTG
             720       730       740       750       760       770


             790       800       810       820       830       840
HUMAN  CAGTCCCTCCATAAGTACCAGCCCCGGCTGCATATCGTTGAGGTGAACGACGGAGAGCCA
       ::::: ::::: :::::::::::::::::::::::: ::::: ::::::: :: ::::::::
MOUSE  CAGTCTCTCCACAAGTACCAGCCCCGGCTGCACATCGTGGAGGTGAATGATGGAGAGCCA
             780       790       800       810       820       830
```

Fig. 1B (continued)

```
              850       860       870       880       890       900
HUMAN  GAGGCAGCCTGCAACGCTTCCAACACGCATATCTTTACTTTCCAAGAAACCCAGTTCATT
       ::::: :::::::: ::::: :::::: ::  :::::::::::::::: ::::::::::::
MOUSE  GAGGCTGCCTGCAGTGCTTCTAACACACACGTCTTTACTTTCCAAGAGACCCAGTTCATT
              840       850       860       870       880       890


              910       920       930       940       950       960
HUMAN  GCCGTGACTGCCTACCAGAATGCCGAGATTACTCAGCTGAAAATTGATAATAACCCCTTT
       ::  :::::::::::::::::: :: ::::: ::::::::::::::: :: :: ::::::::
MOUSE  GCAGTGACTGCCTACCAGAACGCAGAGATCACTCAGCTGAAAATCGACAACAACCCCTTT
              900       910       920       930       940       950


              970       980       990      1000      1010      1020
HUMAN  GCCAAAGGATTCCGGGAGAACTTTGAGTCCATGTACACATCTGTTGACACCAGCATCCCC
       :::::::::::::::::::::::::::::::::::::::: :::::::::: :: :: :::::
MOUSE  GCCAAAGGATTCCGGGAGAACTTTGAGTCCATGTACGCATCTGTTGATACGAGTGTCCCC
              960       970       980       990      1000      1010


             1030      1040      1050      1060      1070      1080
HUMAN  TCCCCGCCTGGACCCAACTGTCAATTCCTTGGGGGAGATCACTACTCTCCTCTCCTACCC
       :: :: :::::::::::::::::::::: : :::::::::::: : :: ::: ::::: ::: ::
MOUSE  TCGCCACCTGGACCCAACTGTCAACTGCTTGGGGGAGACCCCTTCTCACCTCTTCTATCC
             1020      1030      1040      1050      1060      1070


             1090      1100      1110      1120      1130      1140
HUMAN  AACCAGTATCCTGTTCCCAGCCGCTTCTACCCCGACCTTCCTGGCCAGGCGAAGGATGTG
       :::::::::::::::::::::::::: ::::::::::::::::: ::::::: : :::::: ::
MOUSE  AACCAGTATCCTGTTCCCAGCCGTTTCTACCCCGACCTTCCAGGCCAGCCCAAGGATATG
             1080      1090      1100      1110      1120      1130


             1150      1160      1170      1180      1190      1200
HUMAN  GTTCCCCAGGCTTACTGGCTGGGGGCCCCCCGGGACCACAGCTATGAGGCTGAGTTTCGA
       :  :  ::: :::::::::::::::: : :: ::::: ::::: ::::: :: ::::: :::
MOUSE  ATCTCACAGCCTTACTGGCTGGGGGACACCTCGGGAACACAGTTATGAAGCGGAGTTCCGA
             1140      1150      1160      1170      1180      1190


             1210      1220      1230      1240      1250      1260
HUMAN  GCAGTCAGCATGAAGCCTGCATTCTTGCCCTCTGCCCCTGGGCCCACCATGTCCTACTAC
       :: :: :::::::::::: :: ::::::::::::::::::::::::: :: :::::::::
MOUSE  GCTGTGAGCATGAAGCCCACACTCCTACCCTCTGCCCCGGGGCCCACTGTGCCCTACTAC
       1200      1210      1220      1230      1240      1250
```

Fig. 1B (continued)

```
                1270      1280      1290      1300      1310      1320
HUMAN   CGAGGCCAGGAGGTCCTGGCACCTGGAGCTGGCTGGCCTGTGGCACCCCAGTACCCTCCC
        ::  ::::::  ::  :::::::::  :::::::::::  :::::  :::::  ::  ::  :::::  :::
MOUSE   CGGGGCCAAGACGTCCTGGCGCCTGGAGCTGGTTGGCCCGTGGCCCCTCAATACCCGCCC
                1260      1270      1280      1290      1300      1310


                1330      1340      1350      1360      1370      1380
HUMAN   AAGATGGGCCCGGCCAGCTGGTTCCGCCCTATGCGGACTCTGCCCATGGAACCCGGCCCT
        :::::::  ::::  ::  :::::::::::  ::  :::::  :::::::::::::::  ::  ::::
MOUSE   AAGATGAGCCCAGCTGGCTGGTTCCGGCCCATGCGAACTCTGCCCATGGACCCGGGCCTG
                1320      1330      1340      1350      1360      1370


                1390      1400      1410      1420      1430      1440
HUMAN   GGAGGCTCAGAGGGACGGGGACCAGAGGACCAGGGTCCCCCCCTTGGTGTGGACTGAGATT
        :::   :::::::::  ::  :::   :              :::::::  :  :::::::  :::::  :
MOUSE   GGATCCTCAGAGGAACAGGGCTCCT-----------CCCCCTCGCTGTGGCCTGAGGTC
                1380      1390      1400                  1410      1420


                1450      1460      1470      1480      1490      1500
HUMAN   GCCCCCATCCGGCCGGAATCCAGTGATTCAGGACTGGGCGAAGGAGACTCTAAGAGGAGG
        ::  ::  :::  :::::::       ::::  ::  :::::::::  :::::::::::::::  ::::::::::::
MOUSE   ACCTCCCTCCAGCCGGAGCCCAGCGACTCAGGACTAGGCGAAGGAGACACTAAGAGGAGG
                1430      1440      1450      1460      1470      1480


                1510      1520      1530      1540      1550      1560
HUMAN   CGCGTGTCCCCCTATCCTTCCAGTGGTGACAGCTCCTCCCCTGCTGGGGCCCCTTCTCCT
        :   :  :::::::::::::::  :::::::::::  ::  :::::::::::::::::::::::::
MOUSE   AGGATATCCCCCTATCCTTCCAGTGGCGACAGCTCCTCTCCCGCTGGGGCCCCTTCTCCT
                1490      1500      1510      1520      1530      1540


                1570      1580      1590      1600
HUMAN   TTTGATAAGGAAGCTGAAGGACAGTTTTATAACTATTTTCCCAACTGA
        ::::::::::::  :  :::::  :::::::::::  :::::::::::::::
MOUSE   TTTGATAAGGAAACCGAAGGCCAGTTTTATAATTATTTTCCCAACTGA
                1550      1560      1570      1580      1590
```

Fig. 1B (continued)

Fig. 2A

Fig. 2B

Fig. 3A

Fig. 3B

Fig. 3C

ACTIVATED AE7 (Th1)

RESTING AE7 (Th1)

ACTIVATED D10 (Th2)

Fig. 3D

IL18	–	–	+
IL12	–	+	+
anti-CD40	+	+	+

T-bet ⟶

Fig. 4A

Stimuli

| IL-2 | – | + | – | + |
| IL-12 | – | – | + | + |
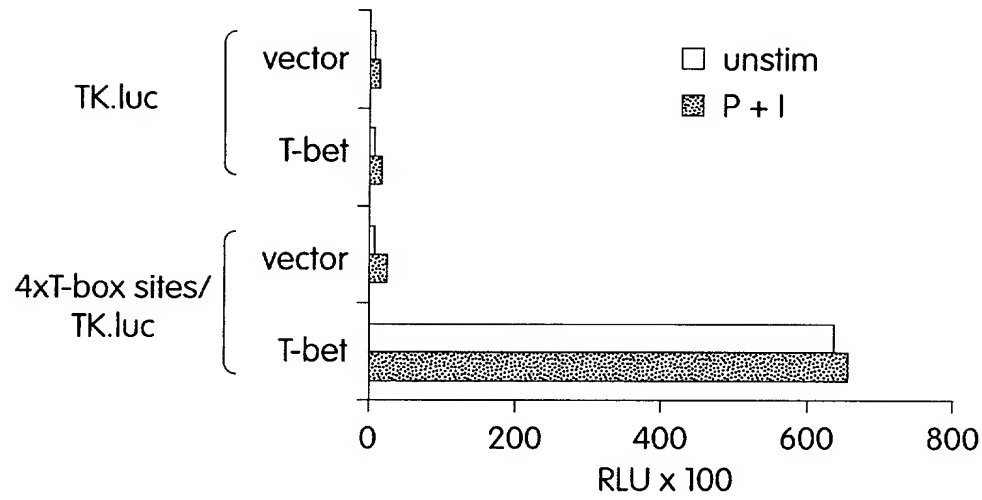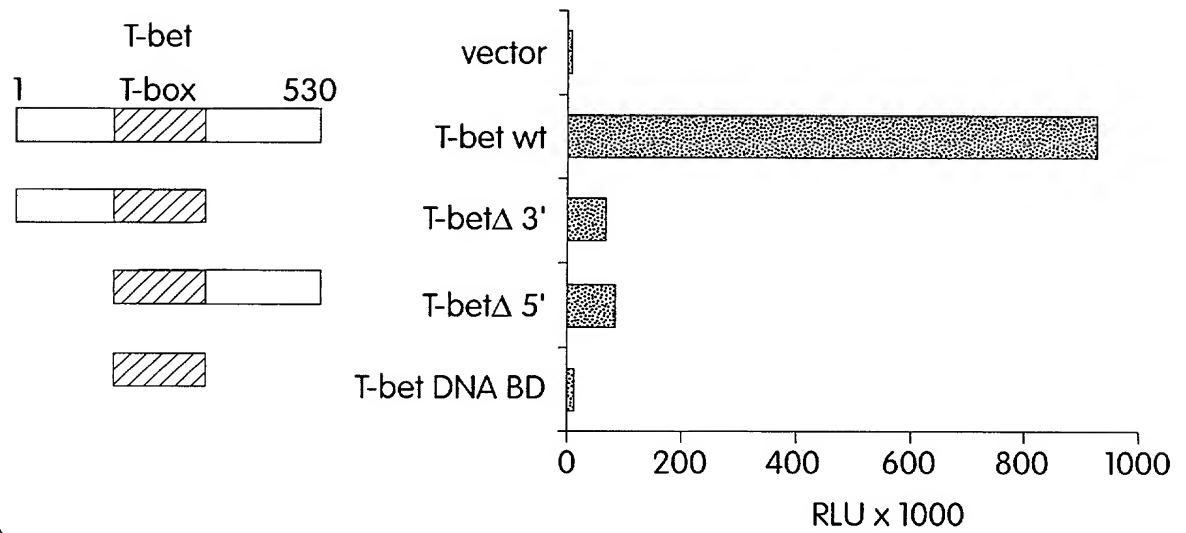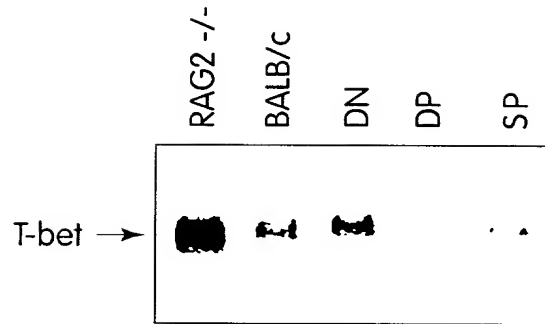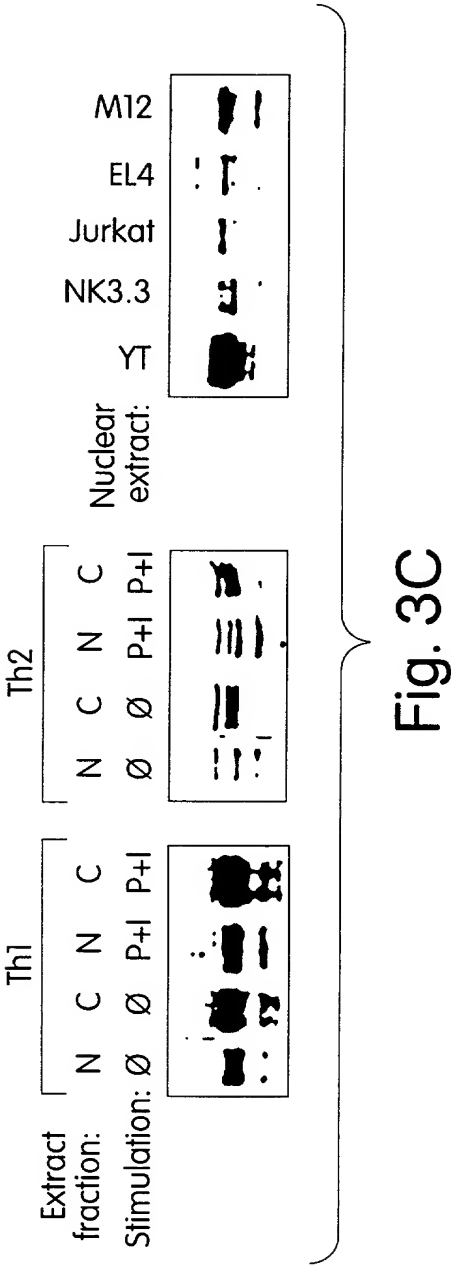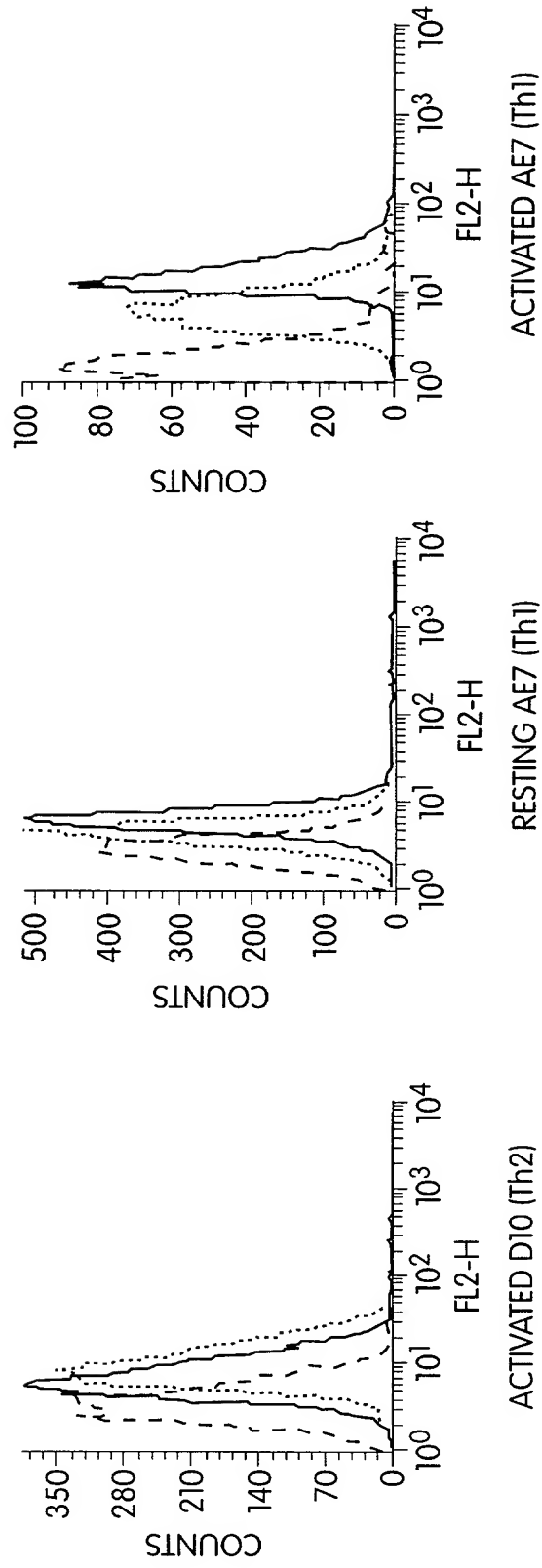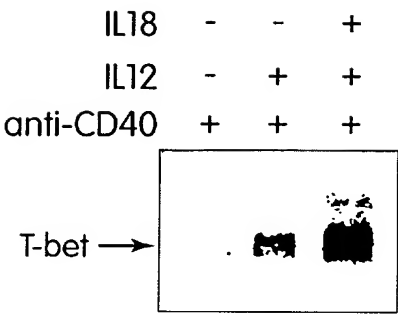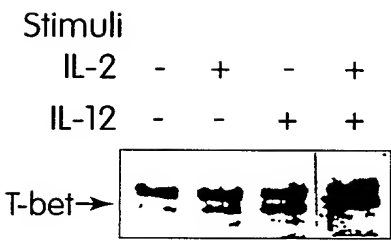
T-bet→

Fig. 4B
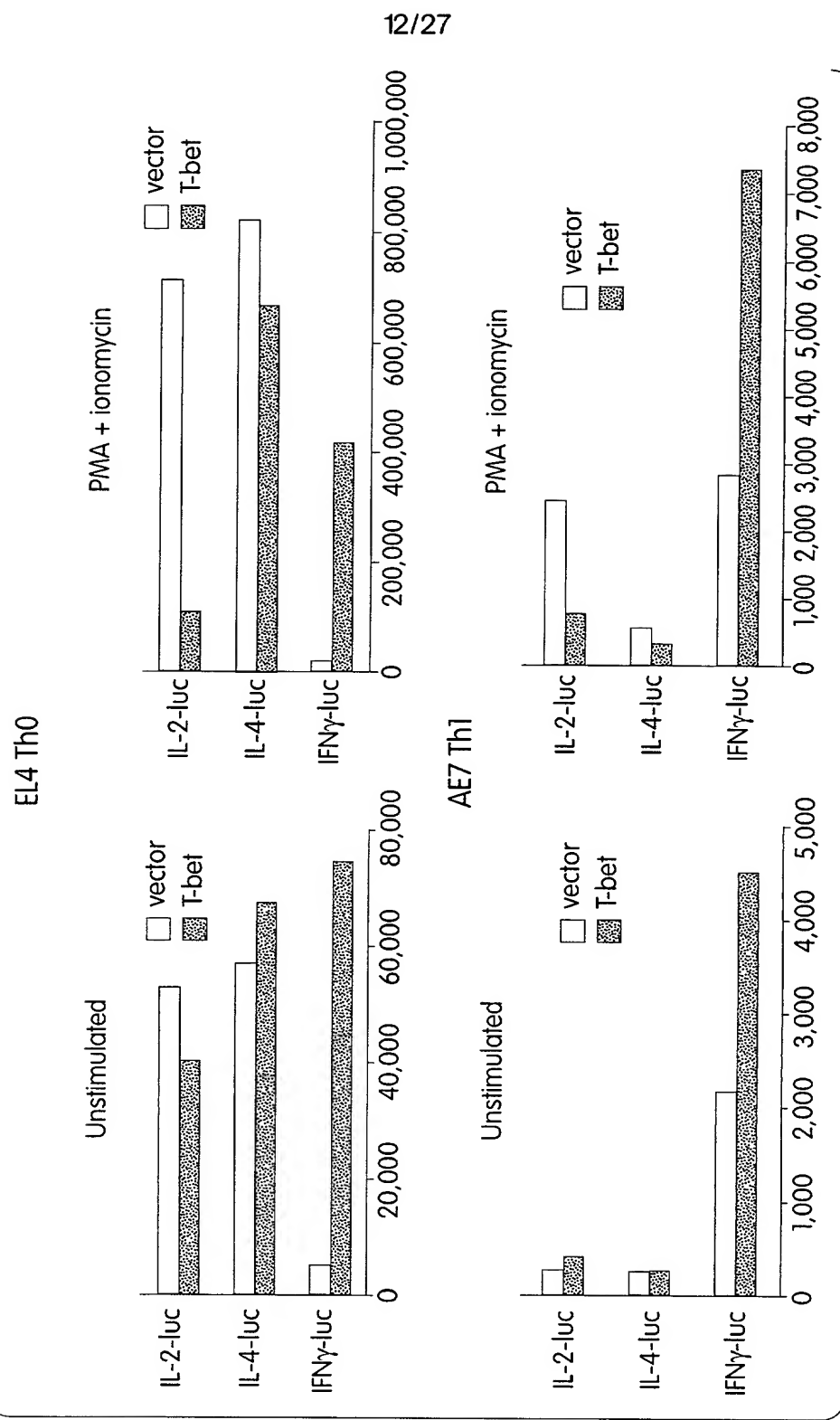
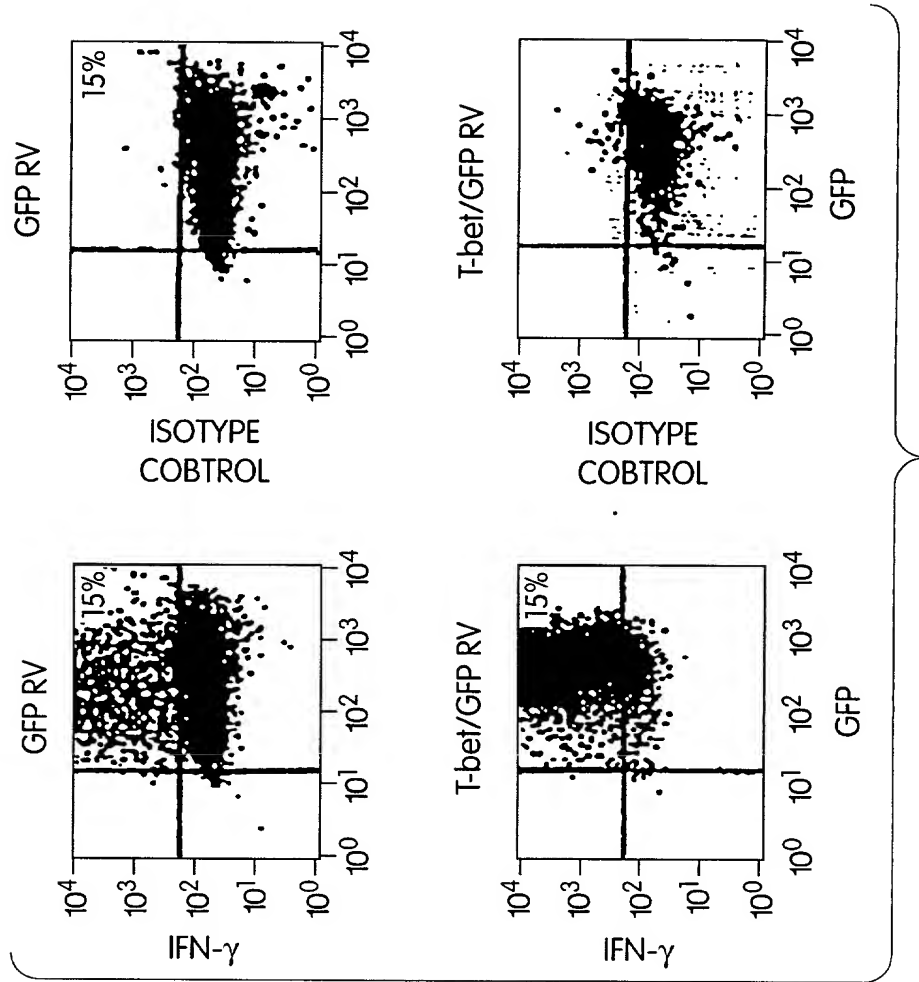Fig. 5
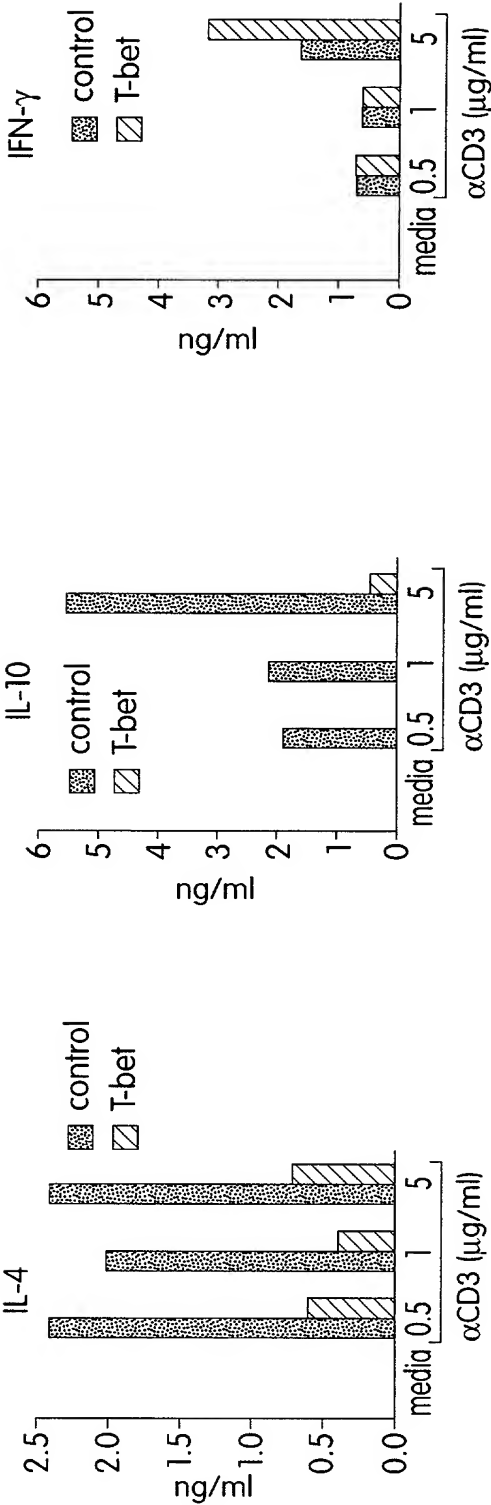
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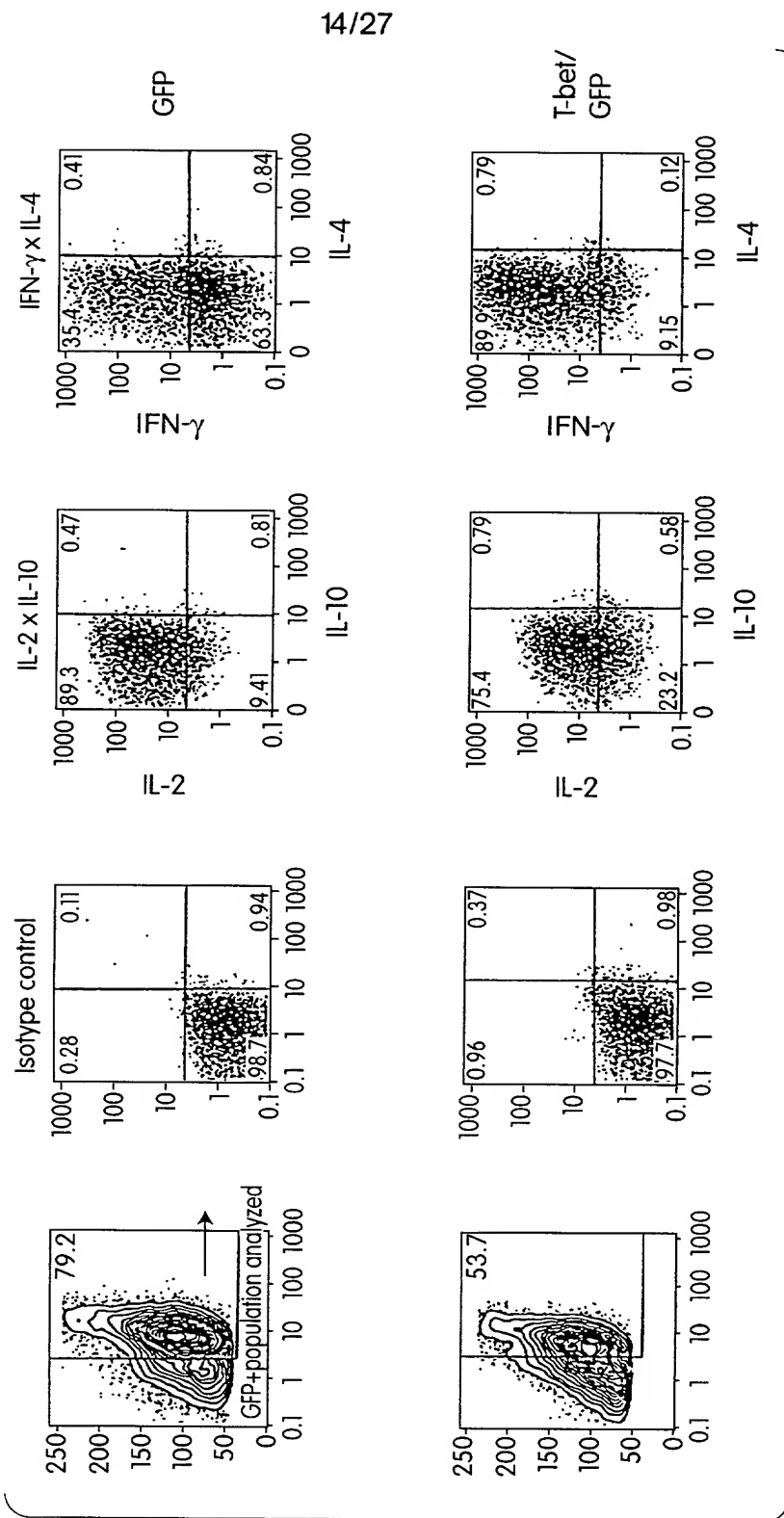
Fig. 7
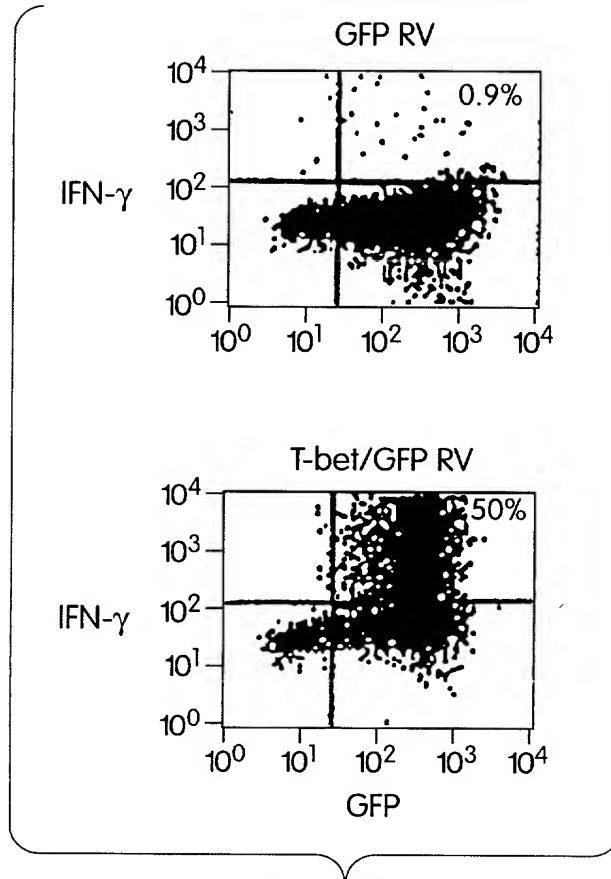
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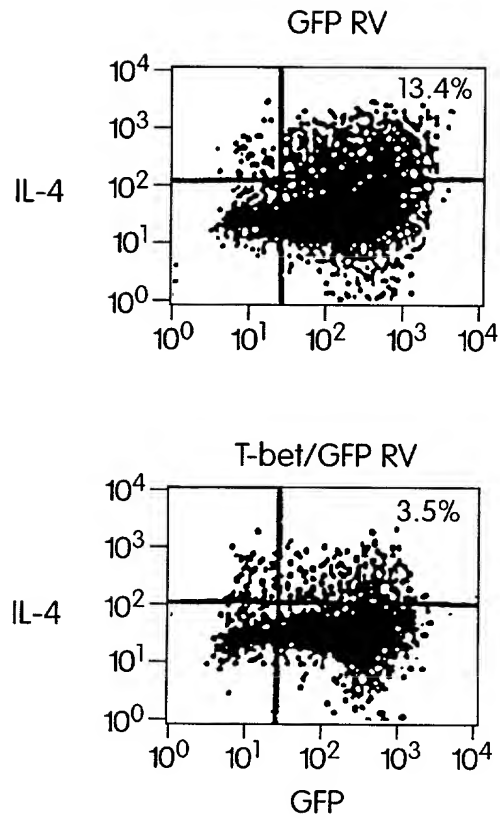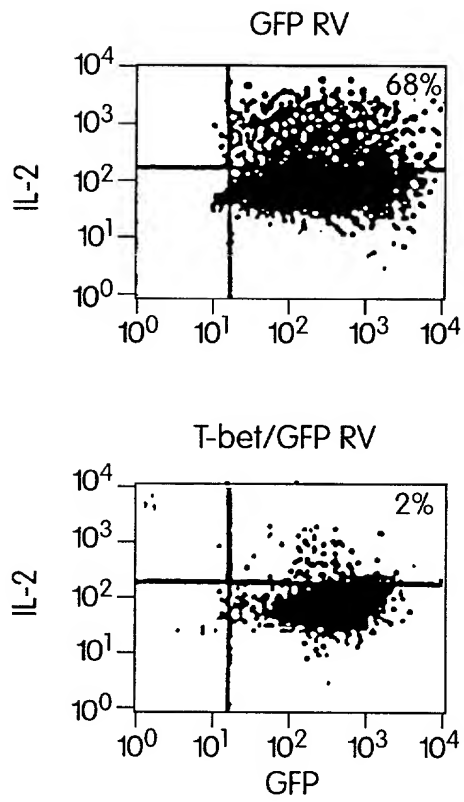
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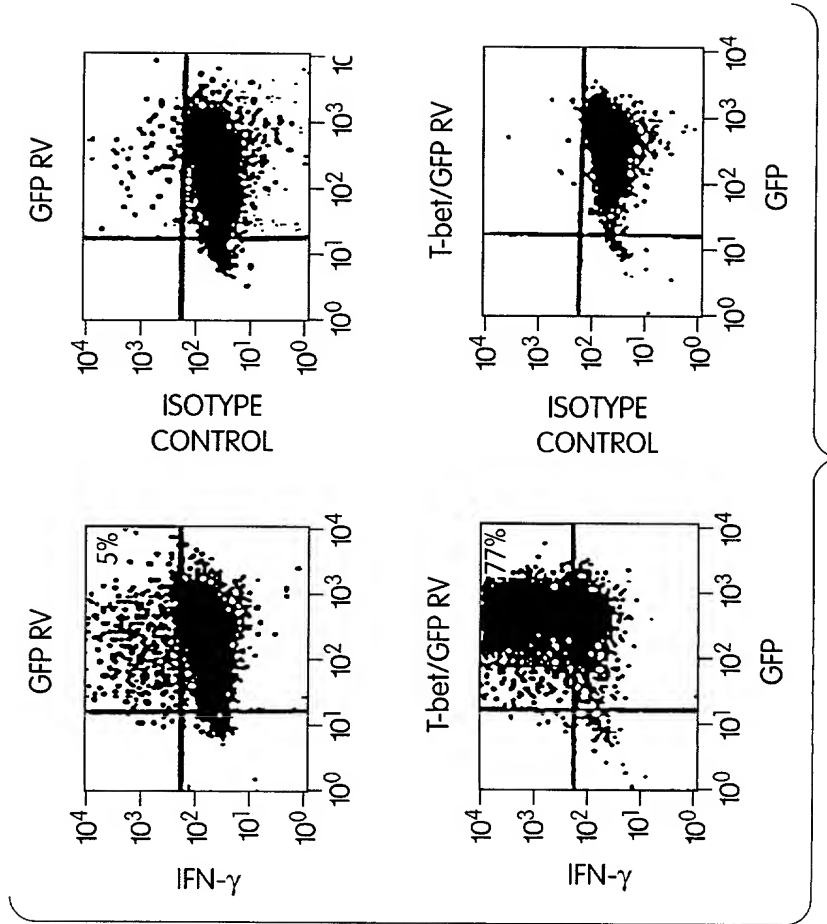
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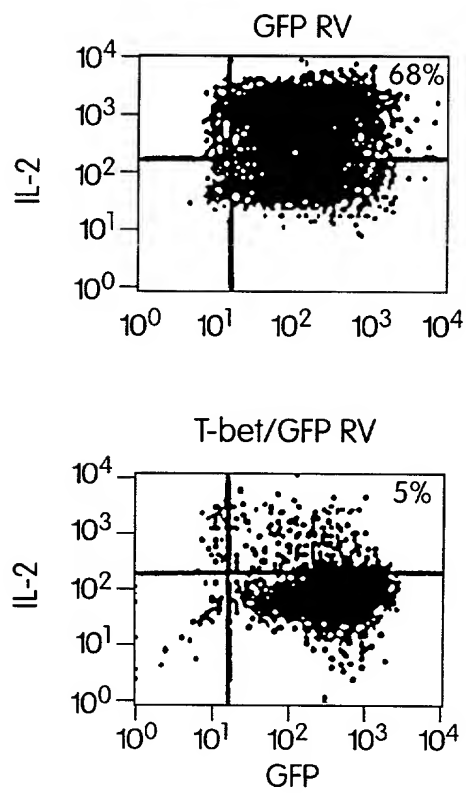
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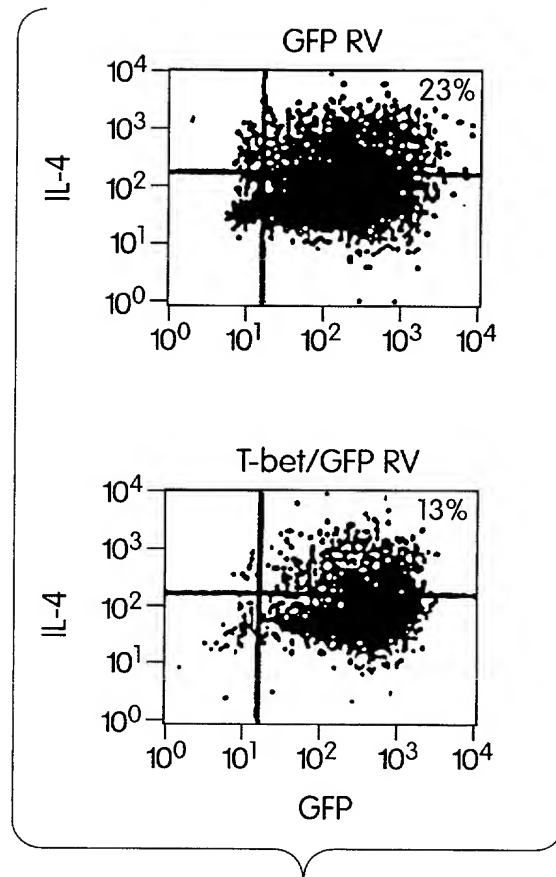
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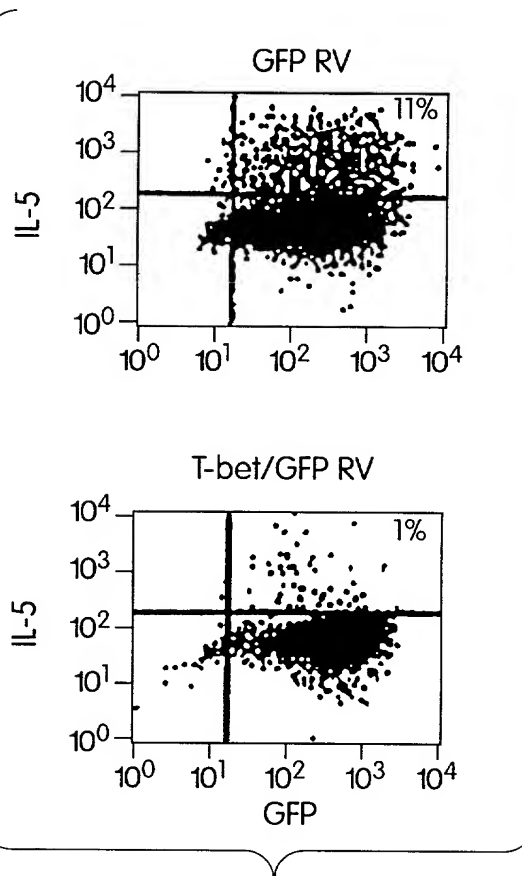
Fig 9D

Fig 10A

Fig. 10B
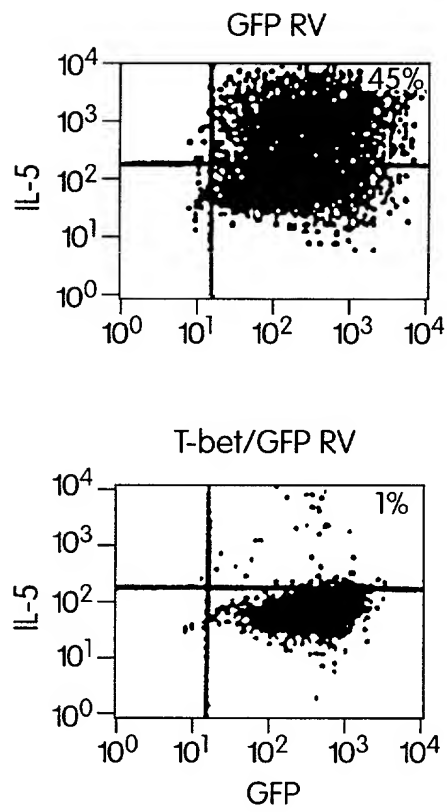
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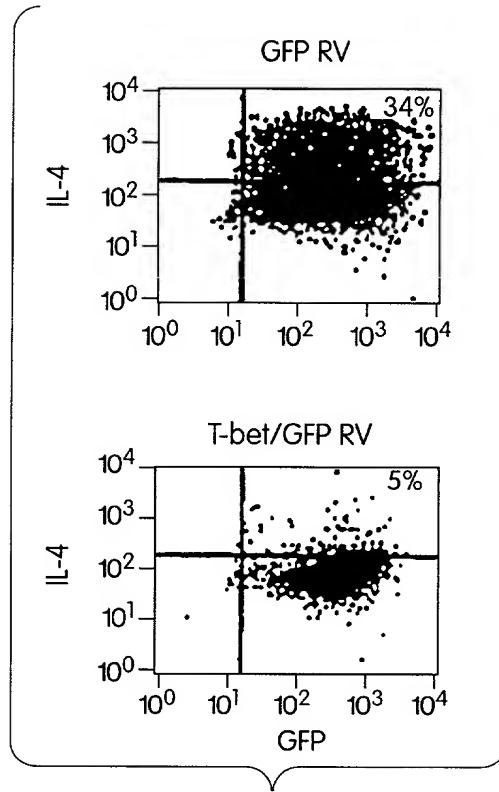
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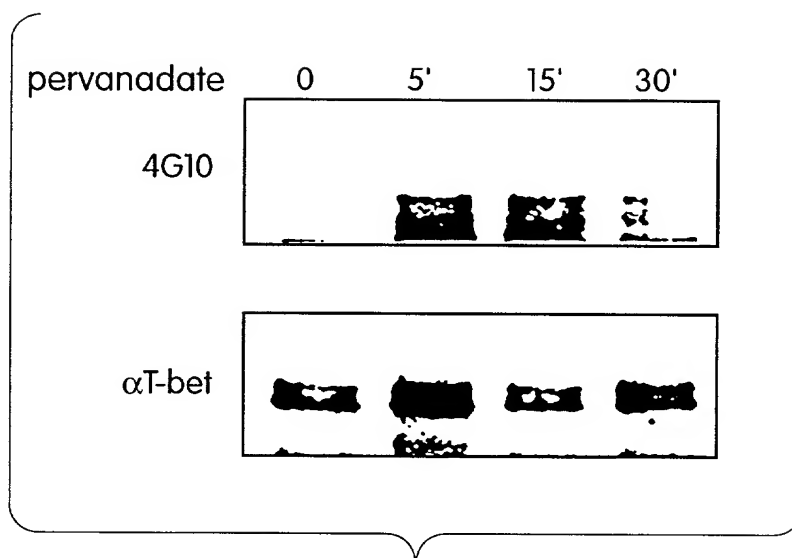
Fig 11

Continuation-in-part Application entitled:
T-BET COMPOSITIONS AND METHODS OF USE THEREOF

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Filed: Herewith
Atty Docket No.:   HUI-040CP

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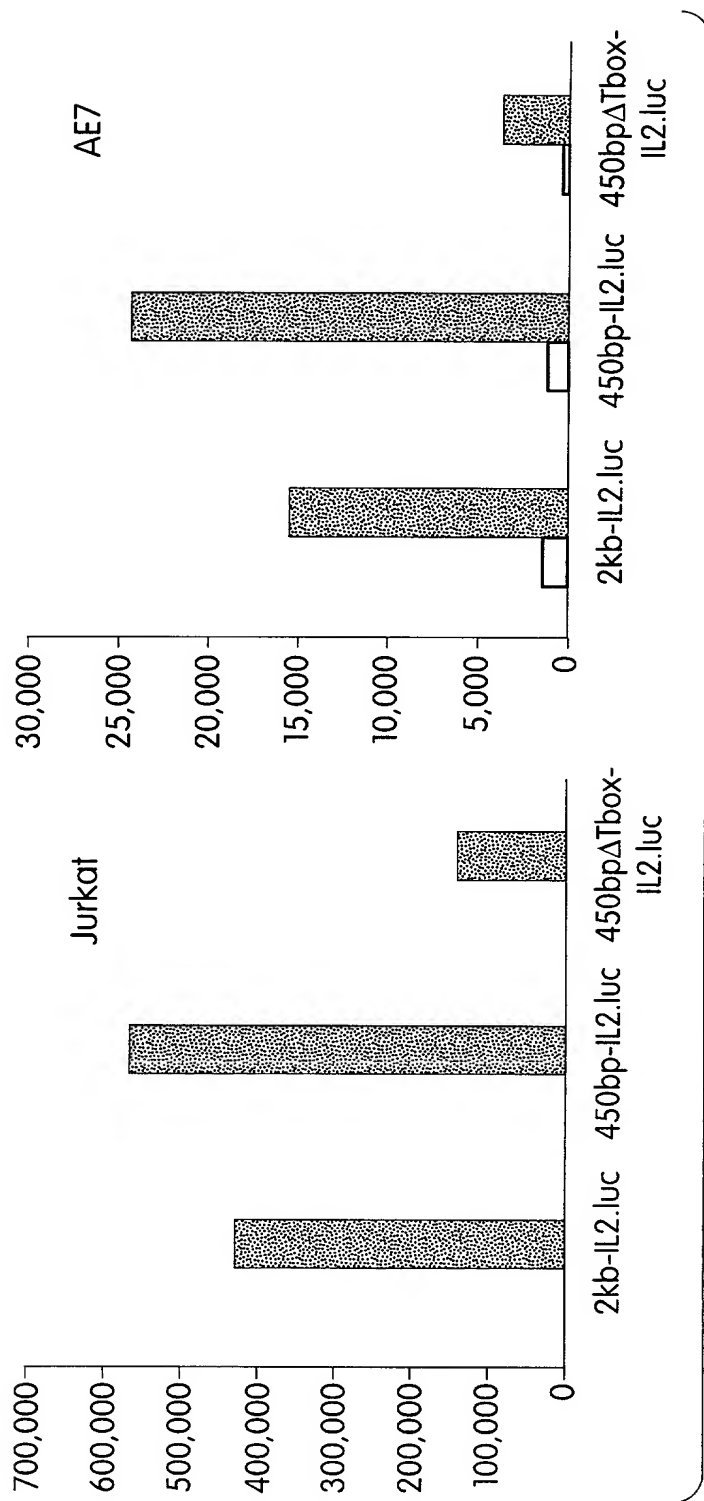
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Fig. 13